CWT5010

GSM RTU

USER'S MANUAL V3.0

CWT 盈科互动

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1 PREFACE

Thank you for using the CWT5010 GSM RTU. You will know well about the functions and operation methods of this product quickly through this User's Manual.
This product is mainly used for remote alarming and control application based on GSM network. Please use it according to the parameters and technical specifications in the User's Manual. Meanwhile, the Notes shall be considered for the usage of radio-control products, especially GSM products. Our Company bears no liability for property loss or bodily injury arising from abnormal or incorrect usage of this product.

Package list

product	quantity
CWT5010 GSM RTU	1pcs
RS232 cable	1pcs
12V Adaptor	1pcs
GSM antenna	1pcs
CD	1pcs

2 INTRODUCTION

CWT5010 GSM RTU is designed as a cost effective remote control system alert device. It monitors up to 4 dry contacts and 4 drivable relay outputs. User-defined SMS is sent to pre-configure mobile phone numbers when a pre-defined alarm condition happens. These pre-configured mobile phone numbers can belong to technicians or engineers who are responsible in handling corresponding alarms. With the aid of this GSM RTU, the alarm condition brings attention to in-charge personnel immediately. Besides it allows those mobile phone users to trigger any relay output by using SMS. The output can be connected with alarm indication device, such as alarm, and others.

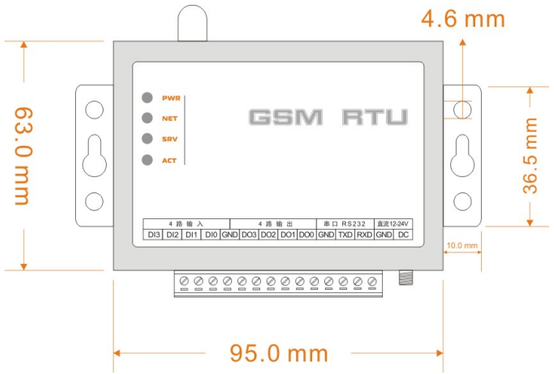
There is a built-in microprocessor chip running on a real-time operating system. It gives immediate response to any change in both inputs and outputs condition. A GSM modem is embedded in the GSM RTU, user has to subscribe a SIM card for the GSM RTU. The GSM RTU can be installed in any location under GSM coverage.

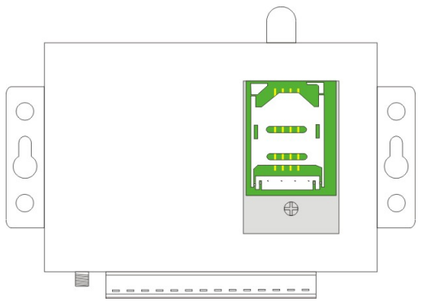
2.1 Parameter

Parameter item	Reference scope
DC Power supply	12-24V DC (Standard adapter: DC 12V/1.5A)
Power consumption	12V input Max. 150mA/Average 50mA
Frequency range	Quad-frequency 900/1800/850/1900HMz
SIM Card	Supporting 3V SIM Card
Antenna	50 Ω SMA Antenna interface
Serial	RS232
Temperature range	-30°C ~ +70 °C
Humidity range	Relative humidity 95%
Digital Input	4 digital inputs(Dry contact)
output	4 drivable relay outputs(open-collector outputs)
Output drive voltage	Equal to input DC voltage
Output drive power	Drive voltage ≤35V, drive current ≤500mA
Exterior dimension	95×63×25mm
Weight	256 g

3 INSTALL

3.1 size

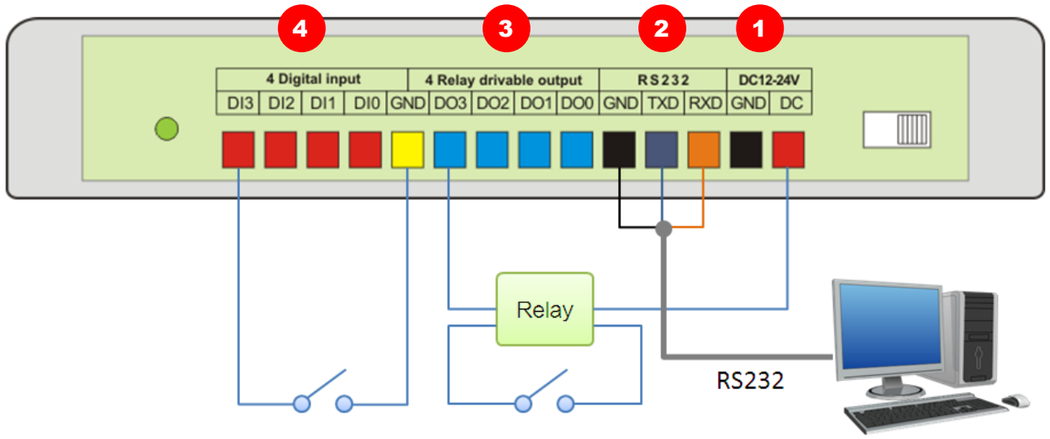




3.2 LED indicator description

Indicator	Status	Indication description
PWR (Red)	Normally light on	Indicator for power supply, which will be light on when the system is power on
NET (Green)	Flicker	SMS module signal indicator, which will flicker slowly after the system is registered in GSM network
SRV (Yellow)	Light on during handling	It will be light on when the system sends sms and light off when the handling is over
ACT (Orange)	Flicker	It will flicker periodically when the system is under operation, and the interval time is 6 sec
Side led (green)	Light on or off	Light on during the internal battery is charge up

3.3 Terminal Description



①. DC9-28V (power in)

DC	positive terminal of the DC power supply (+)
GND	Negative terminal of the DC power supply (-)
Warning ： must be careful that the polarity is not reversed, otherwise, the output will be damaged	

②. RS232

RXD	Receive Data	Connect RS232 cable orange wire
TXD	Transmit Data	Connect RS232 cable blue wire
GND	Ground	Connect RS232 cable black wire

③. 4 drivable relay output

DO0～DO3	negative pole of relay coil
DC	Positive pole of relay coil

④. 4 digital inputs (NO or NC)

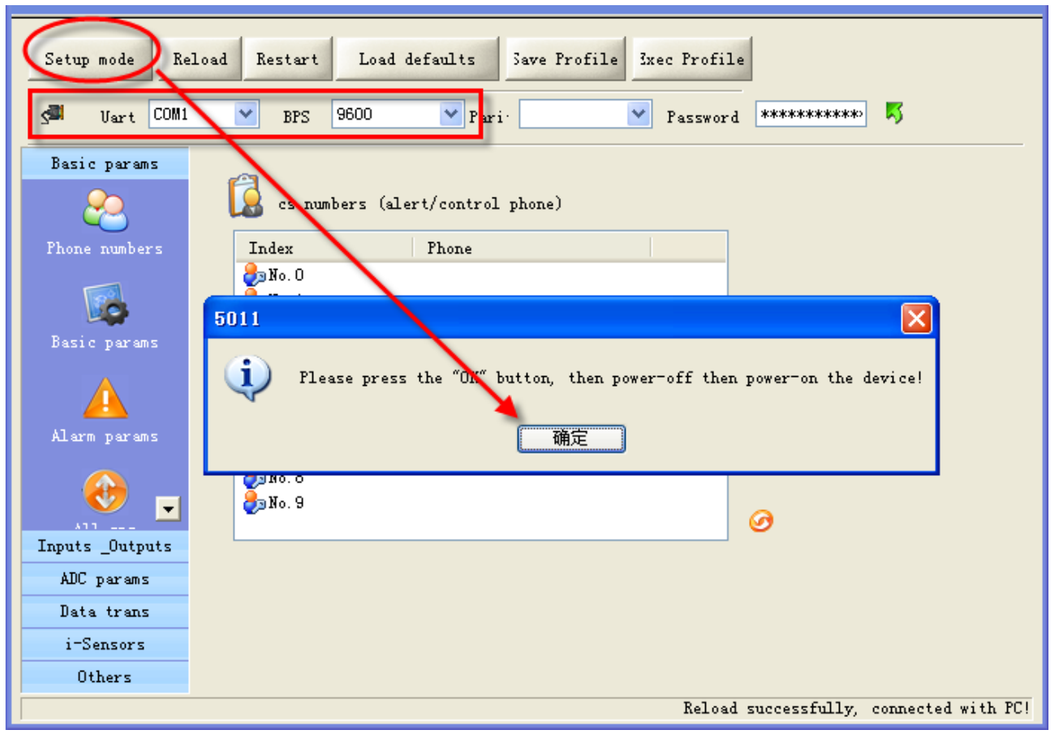
DI0～DI3	Connect NO or NC
GND	Connect COM

4 SETUP PARAMETERS FOR RTU

4.1 Access setup mode

Connect RTU and computer with RS232 cable, and open the configuration software, make RTU access setup mode according to the following figure.

⚠ Note: Please choose the serial port No. and rate correctly, the default communication rate is 9600; default password is “000000”



Definition: Working mode and setup mode

In setup mode, all functions are disabled, only to setup parameters. And RTU must be restart to enter working mode, all functions is enabled, the RTU can alarm and be control.

⚠ **NOTE**

Access setup mode, the simcard and antenna is no need, but access wording mode, the simcard and antenna is necessary.

⚠ **How to know current mode:**

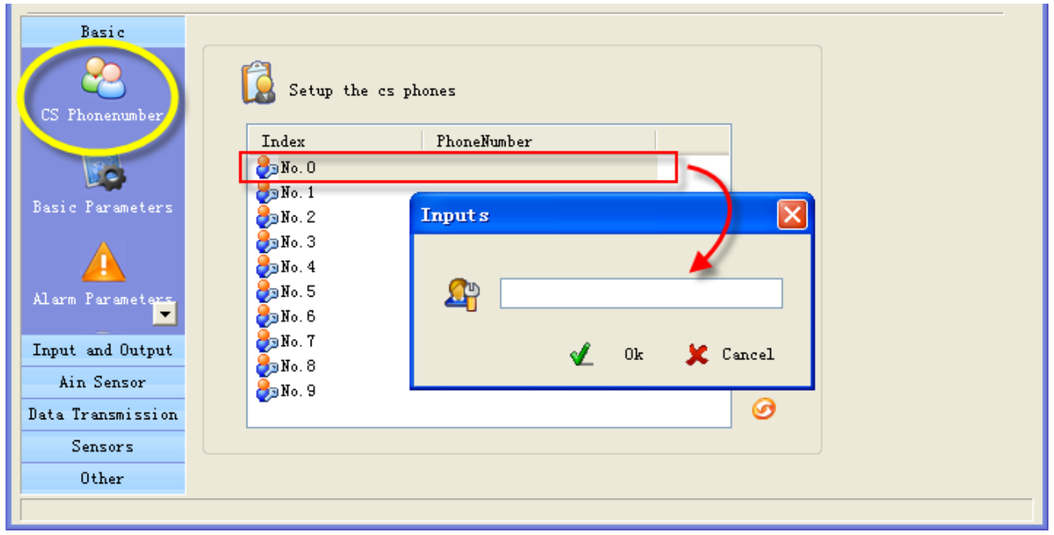
Method 1: Check the ACT light, if the ACT light flickers twice per second, that means it is under the setup mode; the flicker period of the ACT light can be up to 6 sec under the working mode.

Method 2: Check the information from the serial port, if the character string of “dtu come in setup mode” occurs, it means that RTU is under the setup mode.

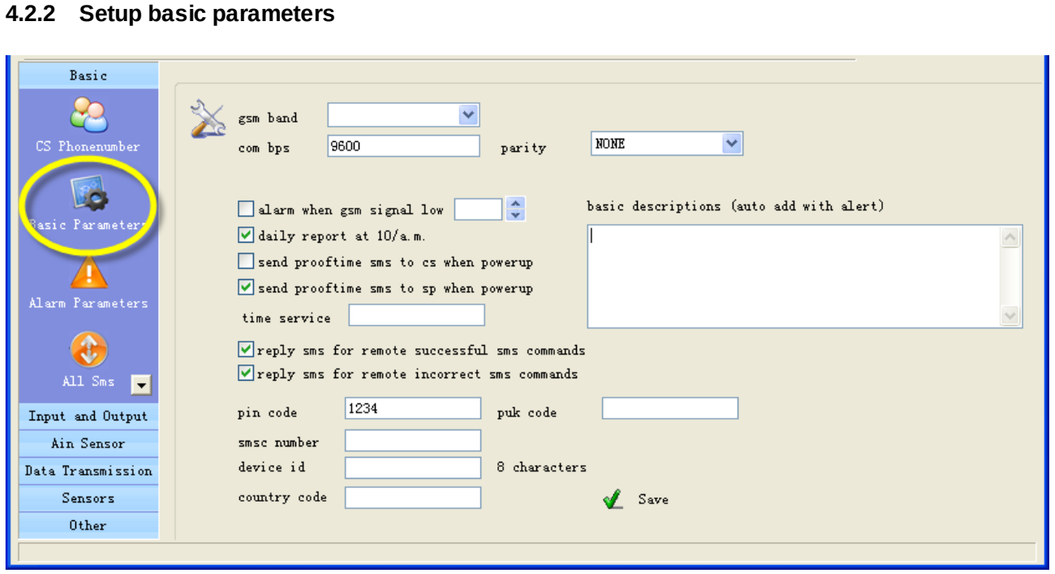
4.2 Setup basic parameters

4.2.1 Setup “CS number”

RTU under working mode, the “CS number” can send sms commands to control RTU and receive sms (include alarm sms, report sms etc). User can set 10 CS numbers, CS0-CS9



4.2.2 Setup basic parameters



⚠ Attention: gsm band, com bps, uart, pin code, country code please using the default parameter

❑ **Alarm for GSM signal low**

GSM signal normal range is 18-32，RTU sends alarm sms to CS number when RTU’s GSM signal value

below the preset threshold, the default is 11.

❑ **Daily report**

enable the option, RTU will send a report sms to CS number at 10:00 every morning for reporting current states, through which the user can make sure the normal operation of RTU.

❑ **Proof time**

Proof time is keeping the RTU's os (operation system) has correct time. RTU can execute daily report, timing arm or disarm, timing output at correct time.

Send proof time sms to cs when power up

When RTU power up, it send a sms to CS0 to request proof time, CS0 can reply sms"999" to RTU to complete proof time.

Send proof time sms to sp when power up

SP phone number is a phone that cans automatic reply a SMS to any incoming SMS, RTU use it to update interior Clocker by the timestamp in SMS, the SMS contents is not important.

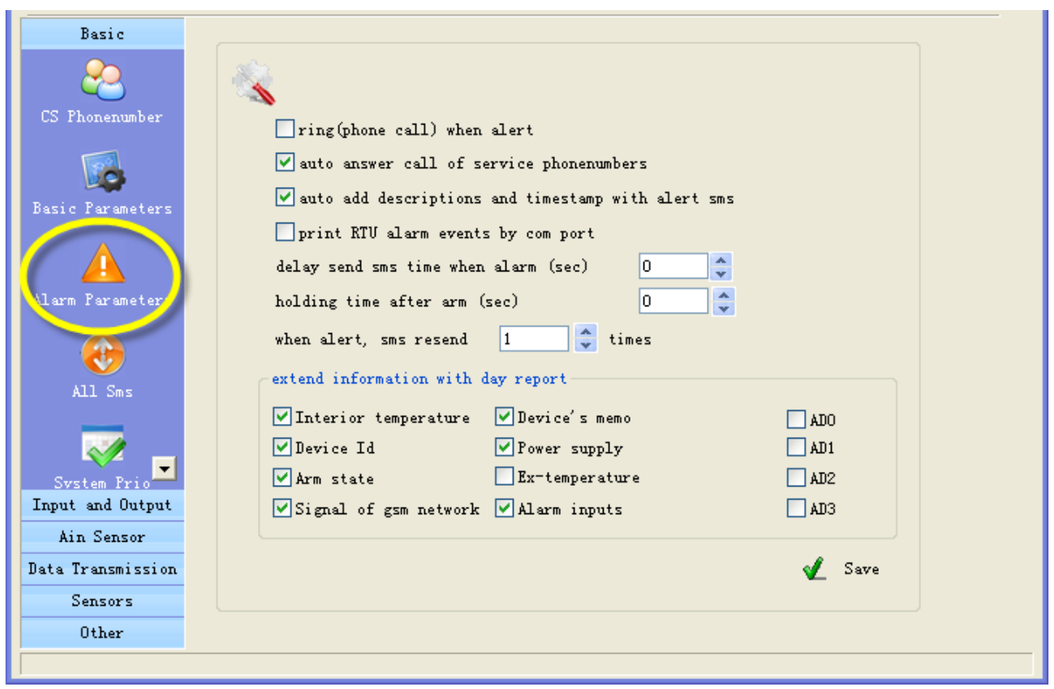
❑ **Device description**

You can add description with RTU (such as install position, user information), the description is show in RTU alarm sms.

❑ **Device ID**

The device ID is an 8-byte ASCII characters which is show in RTU state sms.

4.2.3 Alarm parameters



❑ **ring when alert**

Enable this option, RTU will give CS number a phone call then send sms when alarm

❑ **auto answer call of service phone numbers**

⚠ Attention: This option is valid for the RTU models that have audio interface.

If MIC and speaker are connected; RTU auto answer when CS numbers call it, so user can remote monitor voice and speaking.

❑ **Auto add basic description with alert sms**

Enable this option, the description (such as install position, user information) that have been defined by user will show in alarm sms and daily report sms.

❑ **print RTU alarm events by com port**

Enable this option, when RTU alarm, it sends the alarm data to com port with CWT_IO data format.

❑ **delay send sms time when alarm(disarm delay)**

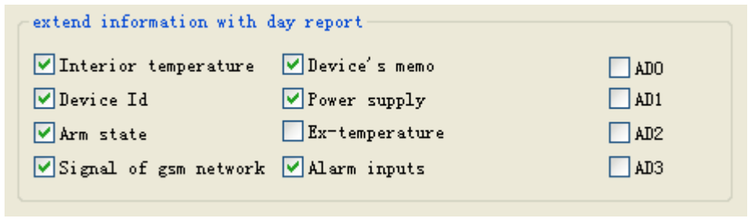
Define the time; you have an enough time to disarm RTU when you go into the monitor area.

❑ **Holding time after arm(arm delay time)**

Define the time; you have an enough time to arm RTU when you leave the monitor area.

❑ **Extend information with report**

RTU can send report sms to cs phones by timer or user's inquiry by sms command, this function is designed to let user know the RTU is stilling working and its status, enable or disable follow information to show in report.



- **Interior temperature:** The internal temperature sensor is optional, if RTU has added it, the temperature value will show in the daily report.

⚠ Attention: A standard RTU have not internal temperature sensor

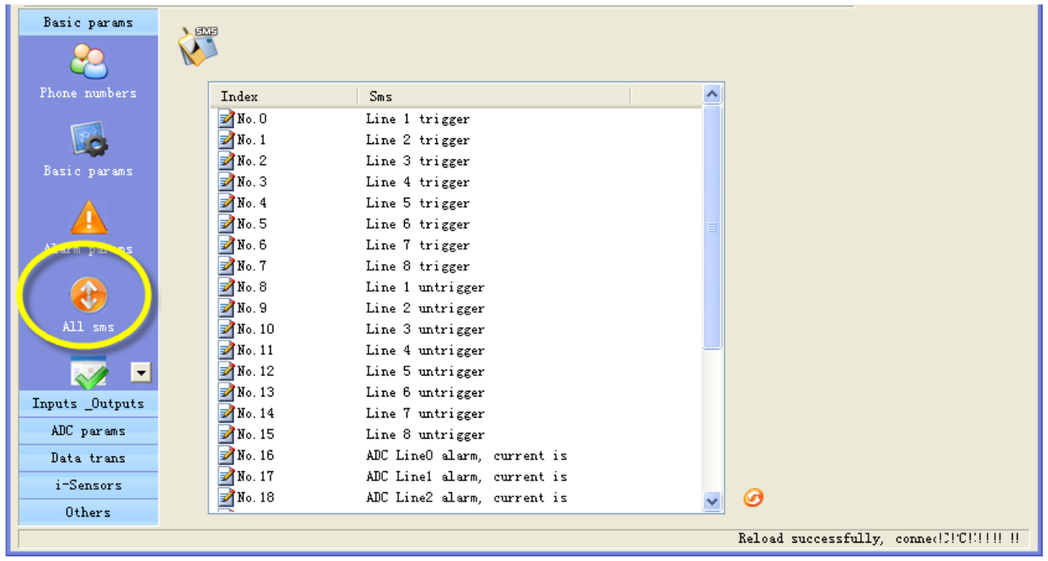
- **Device Id:** enable this option, ID will show in the daily report.
- **Arm status:** enable this option, arm or disarm status will show in the daily report.
- **Signal of gsm network:** enable this option, GSM signal value will show in the daily report.
- **Device's memo:** enable this option, Device description will show in the daily report.
- **Power supply status:** enable this option, the daily report will show power supply status
- **Ex-temperature:**

⚠ Attention: This option is valid for the RTU models that have temperature inputs (DS18B20 inputs).

Enable this option, all the value of extend temperature sensor will show in the daily report.

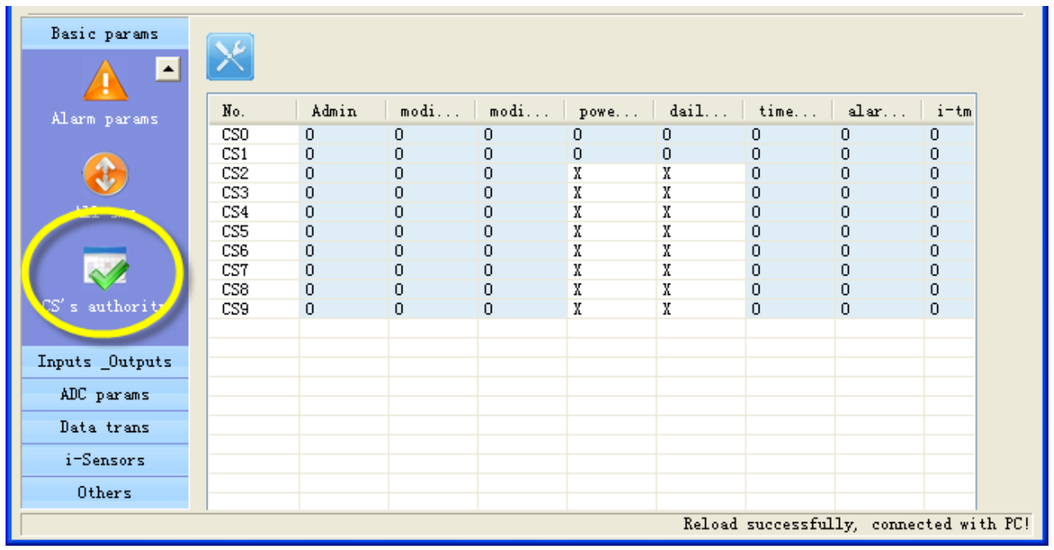
- **Alarm inputs:** enable this option, the inputs that are in alarm status will show in the daily report.
- **AD0~AD3:** enable those options, all the value of AD input will show in the daily report.

4.2.4 ALL SMS



In this page, you can see all sms contents that you have defined, include digital inputs alarm/recover sms, AD inputs alarm/recover sms etc. you can Double-click it to modify.

4.2.5 System Prio


Basic params
Alarm params
CS' s authority
Inputs _Outputs
ADC params
Data trans
i-Sensors
Others
No. Admin modi... modi... powe... dail... time... alar... i-tm
CS0 0 0 0 0 0 0 0 0
CS1 0 0 0 0 0 0 0 0
CS2 0 0 0 X X 0 0 0
CS3 0 0 0 X X 0 0 0
CS4 0 0 0 X X 0 0 0
CS5 0 0 0 X X 0 0 0
CS6 0 0 0 X X 0 0 0
CS7 0 0 0 X X 0 0 0
CS8 0 0 0 X X 0 0 0
CS9 0 0 0 X X 0 0 0
Reload successfully, connected with PC!

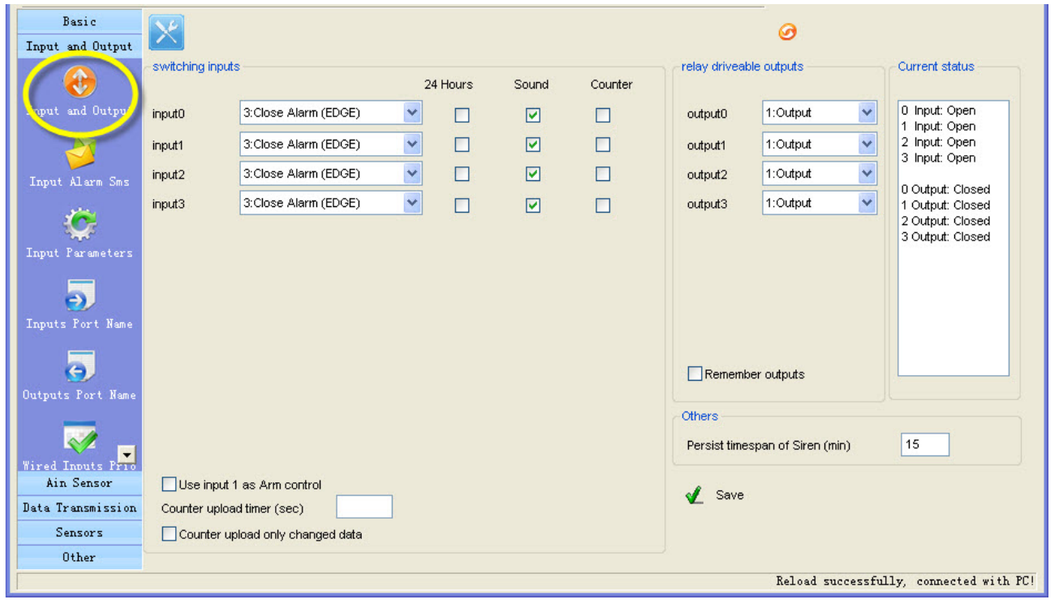
In this page, you can set authorization for CS numbers

"O" means enable authorization; "X" means disable authorization.

Authority	Explanation
admin	Can Arm/disarm or not
Modify by sms	This CS number can be modify by sms command or not
Change cs phones	This CS number can modify other CS number by sms command or not
Powerup sms	Can receive the status sms or not when RTU is restarted by sms command
Daily report sms	Can receive the daily report or not
Timer mms	Null
Alarm mms	Null
I-tmp alarm sms	Can receive the alarm sms or not when internal temperature sensor alarm
I-tmp alarm ring	Can receive the alarm phone call or not when internal temperature sensor alarm
Power fail sms	Can receive the alarm sms of power failure or not
Power fail ring	Can receive the alarm phone call of power failure or not
Signal low alarm	Null
Sample sms	Null
M2M svr	RTU send sms to the CS number with CWT_IO protocol
Arm notify	Can receive sms when RTU arm or disarm

4.3 Input and Output

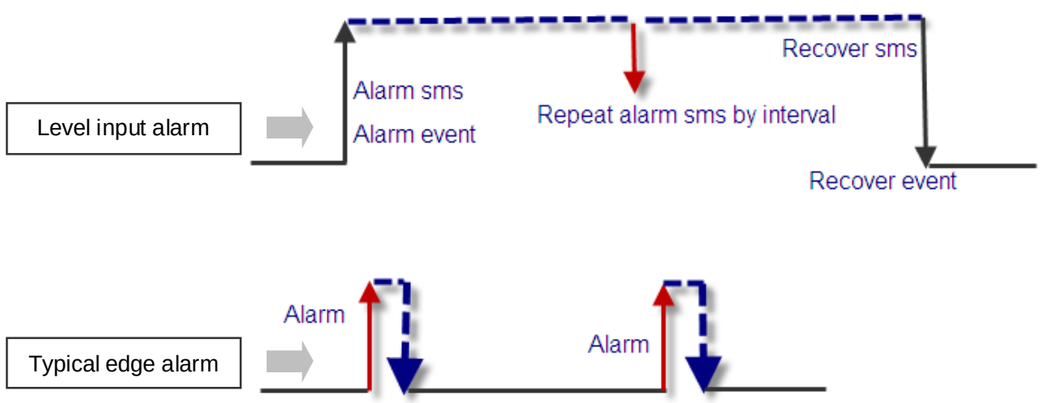
4.3.1 Setup input and output types



Digital inputs types

Input signals have two types, EDGE_IN (edge triggering) and LEVEL_IN (state triggering).

⚠ **ATTENTION:** The key deference between Level and Edge is Level input has recovery sms message and Level input can repeat alarm status sms notify by an interval.



❑ **24 Hours**

If enable this option, the digital input will execute alarm action (send alarm sms, interlock etc) when it is triggered, even RTU is in disarm status.

❑ **Sound**

Means this channel input alarm event can cause internal buzzer and extend buzzer or siren action.

❑ **Use digital input 1 as arm control**

Enable this option, RTU is in arm mode if digital input 1 is opened, RTU is in disarm mode if digital input 1 is closed, so user can connect a button to switch mode for arm or disarm

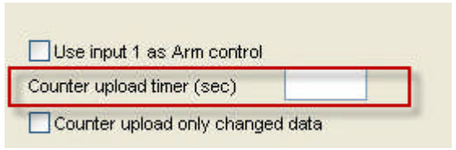
⚠ **ATTENTION:** Use digital input1 as arm control you need select the type of input1 is "TO CLOSE ALARM (LEVEL)" and delete the alarm/recover sms of input 1

❑ **Counter**

Enable or disable this channel input as counter input which catch greater than 100ms plus.

❑ **Counter upload timer**

Setup the counter GPRS upload interval



❑ **Counter upload only changed data**

Automatic counter upload mode is a mode to Save GPRS, not report data if value not changed.

⚠ **Attention:** This option is valid for the RTU models that have GPRS function.

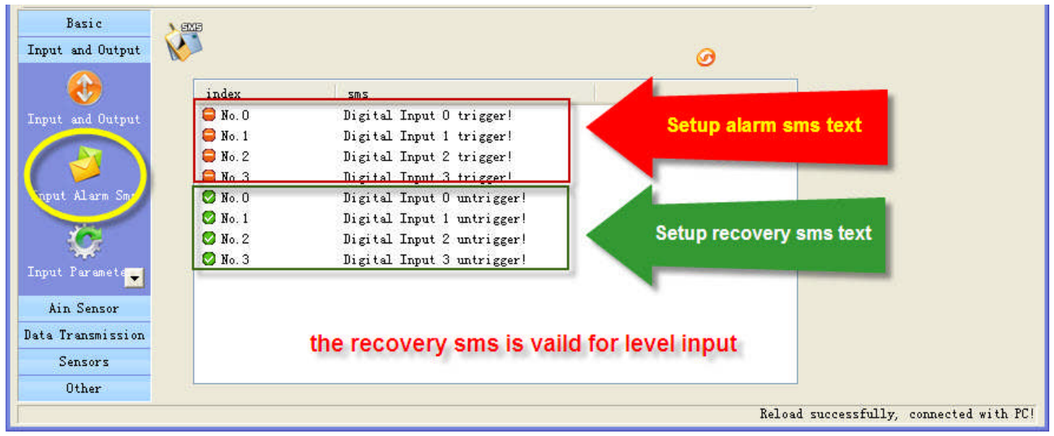
Output types

0	disable	
1	relay drivable output	Drive relay, drive electricity <0.2A Output drive relay voltage Equal to input DC voltage Output power: Drive voltage ≤35V, drive current ≤200mA
2	Buzzer	This line's actions will synchronize with internal buzzer.
3	SNAPSHOOT	This line wills shortly action when any alarm happens.
4	SIREN	This line continuous drives for 1 minute by default. And the interval can be user define. Others Persist timespan of Siren (min) 15

❑ **Remember outputs status**

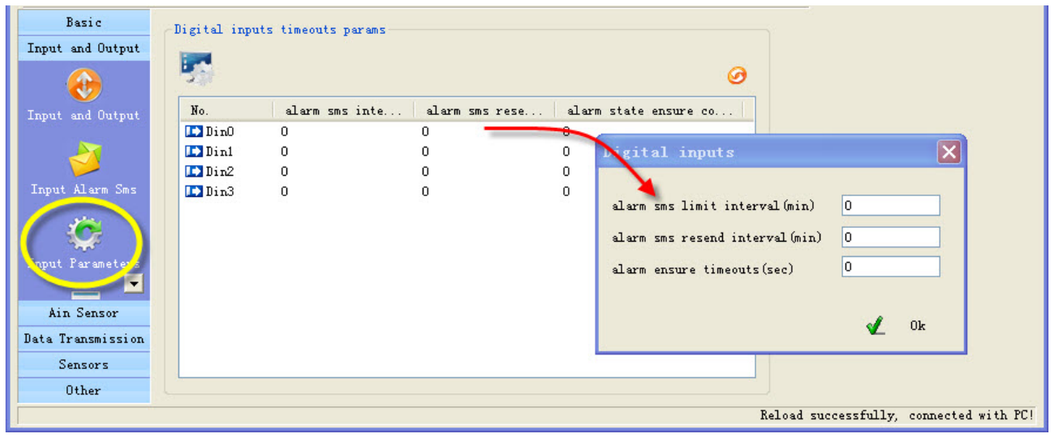
RTU's outputs default status is open; it is possible closed during working. After restart, the outputs will be reset, status is open. If enable the option, output can recover the status that before restart.

4.3.2 Define alarm and recover sms of digital input



All of the input lines sms can be modify. A SMS composed of not more than 60 characters

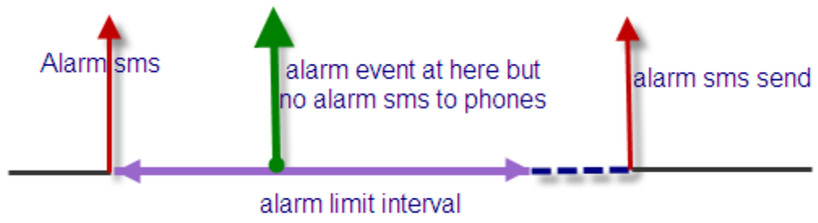
4.3.3 Setup inputs timeouts



This page designed to setup input timeouts property. There are 3 interval related with inputs.

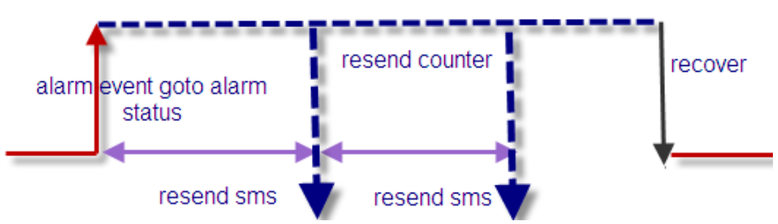
1. Alarm sms limit interval

It is designed to avoid amounts of alarm/recover sms in a short time.



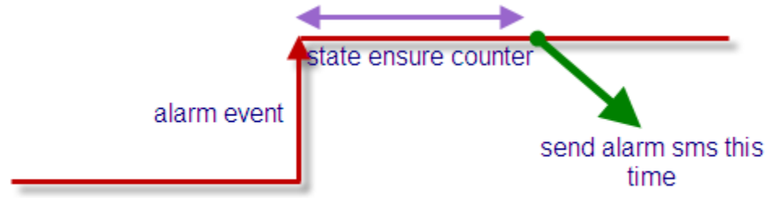
2. Alarm sms resend interval

It is designed for repeat alarm status notifies to phones, 0 means disable repeat notification.

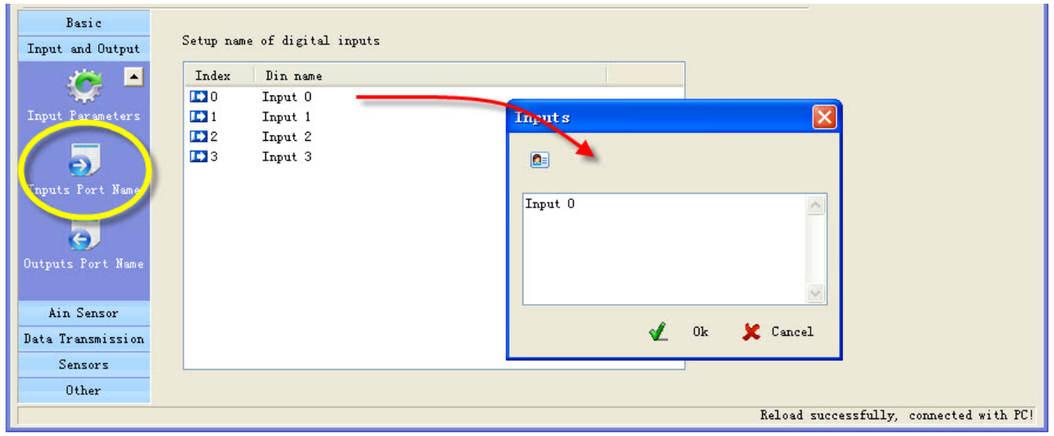


3. Alarms ensure timeouts

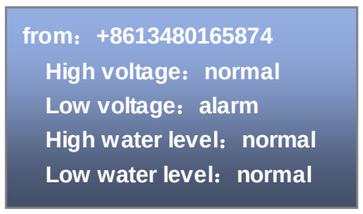
It is a counter of alarm status ensure timer, designed to avoid shake mistakes. 0 means no counter.



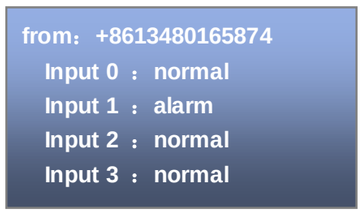
4.3.4 Setup digital inputs/outputs port name



If you send sms command to require inputs status, there is a contrast of returning



Have setup input name



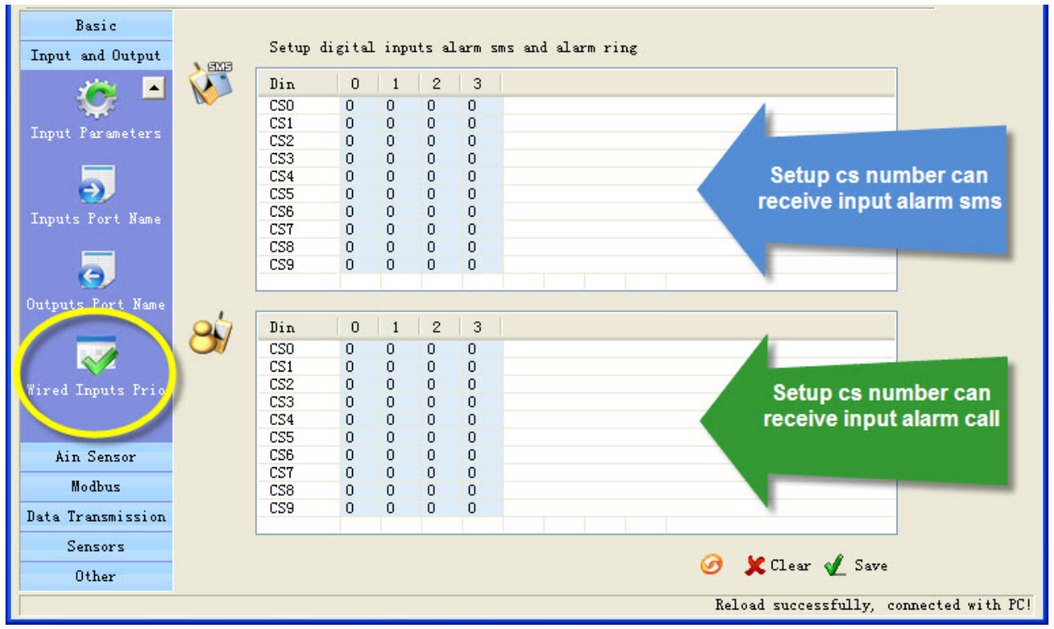
Have not setup input name

Setup outputs name is same

4.3.5 CS's DIN authority

This page can setup the authority of CS phone receive digital input alarm sms and alarm call

"**O**" means this cs phone will receive related line in sms, "**X**" means not.



Example:

Din	0	1	2	3
CS0	X	0	0	0
CS1	0	X	0	0
CS2	X	0	0	0
CS3	0	0	0	0
CS4	0	0	0	0
CS5	0	0	0	0
CS6	0	0	0	0
CS7	0	0	0	0
CS8	0	0	0	0
CS9	0	0	0	0

This settings means CS0 don't receive input 0 alarm

CS1 don't receive input1 alarm sms.

CS3 don't receive input0 alarm sms.

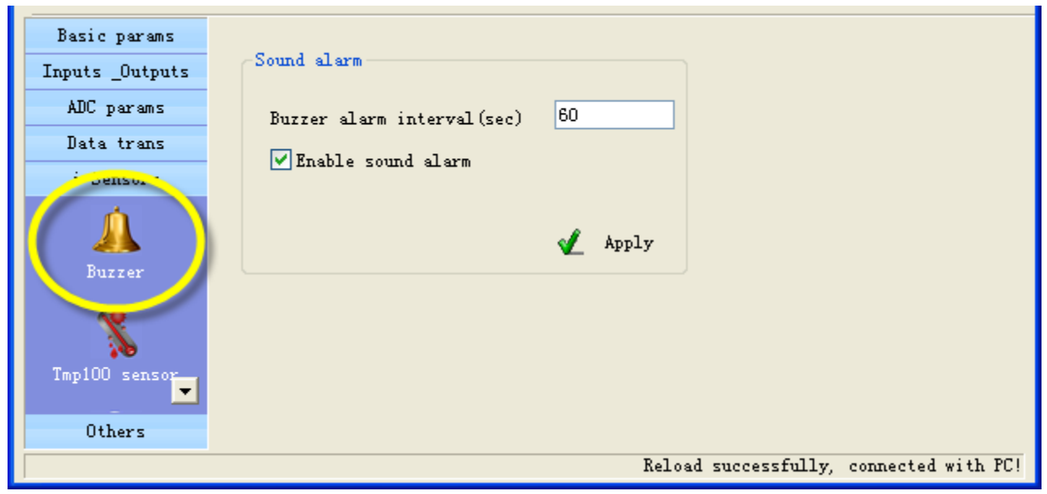
4.4 Setup I-sensors

4.4.1 Buzzer

⚠ Attention: This setting is valid for the RTU models that have buzzer.

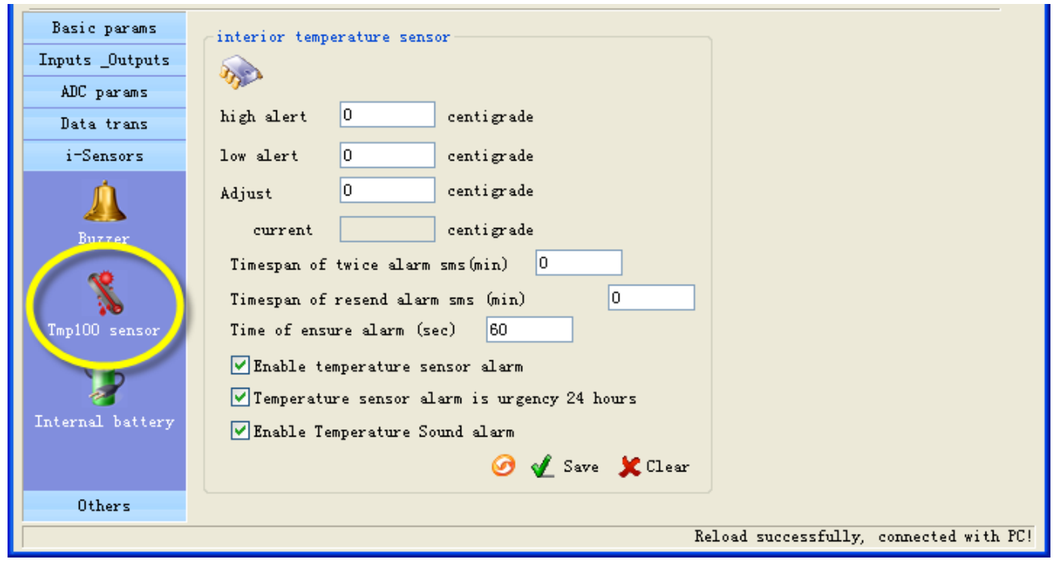
The buzzer can be activated when alarm.

In this page, you can enable or disable the buzzer and set interval time of alarm



4.4.2 Tmp100 sensor (optional)

⚠ Attention: This setting is valid for the RTU models that are added interior temperature sensor, the tmp100 temperature is optional, a standard RTU have not internal temperature sensor.



You can preset a high and a low temperature value, if temperature is over normal range, RTU alarm. You also can send sms command to RTU to get current temperature.

User can set “Adjust” value to calibrating temperature value

❑ **Timespan of twice alarm sms**

It is designed to avoid amounts of alarm/recover sms in a short time.

❑ **TMPRS time: timespan of resend alarm sms**

It is designed for repeat alarm status notifies to phones, 0 means disable repeat notification.

❑ **time of ensure alarm**

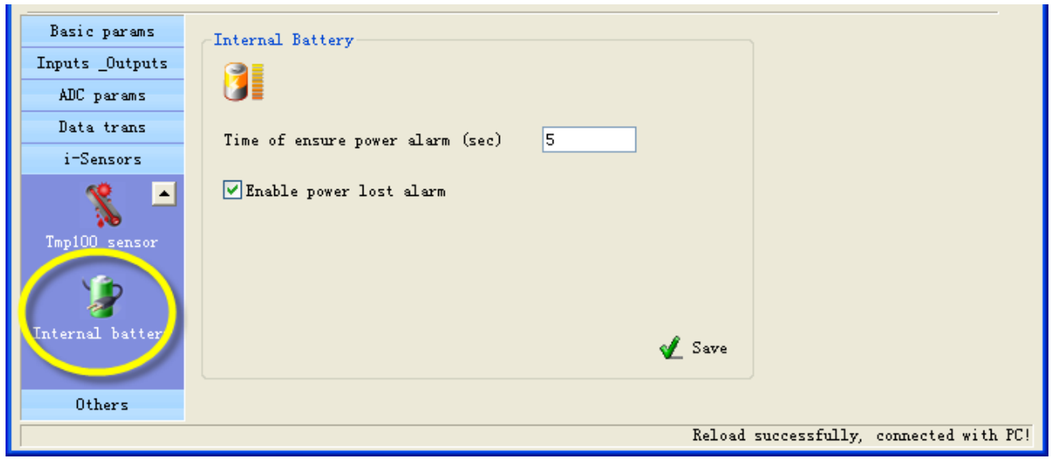
It is a counter of alarm status ensure timer, designed to avoid shake mistakes. 0 means no counter.

4.4.3 Internal battery (optional)

⚠ Attention: This setting is valid for the RTU models that are internal battery.

It is designed to realize power lost alarm

When external power cut off, RTU Powered by internal battery and alarm to cs numbers



❑ **time of ensure power alarm**

When the time of external power lost is over the time, RTU alarm, “0” means disable the function.

Battery parameter:

- Lithium battery
- Voltage: 3.7V
- Capacity: 800mAh
- Limited voltage for charging 4.2V
- Implementation standard GB/T 18287-2000

4.5 Setup extend temperature sensor

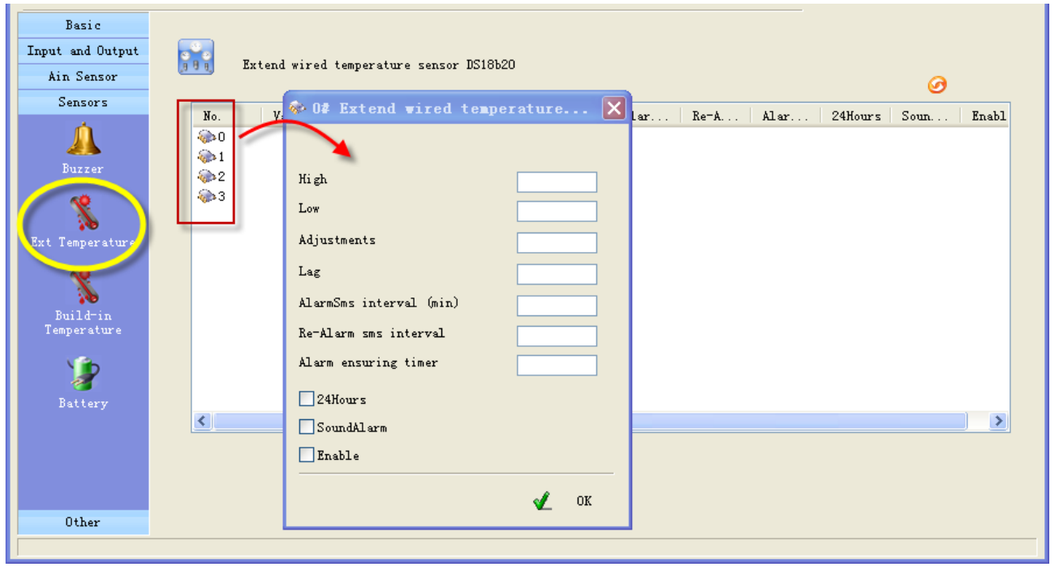
4.5.1 Setup extend temperature

CWT5016 can connect 4 extend wired temperature sensors DS18B20.

You can preset a high and a low level for every channel, if the current temperature is above the high level or below the low level, CWT5016 alarm. You can also send sms command to get current temperature.

DS18B20 temperature probes

temperature range: -55℃~+125℃; precision：±0.5℃



❑ **Adjustments**

You can set the value to reduce error.

❑ **Alarm sms interval**

The time is designed to avoid amounts of alarm/recover sms in a short time.

❑ **Re-alarm sms interval**

Designed for repeat alarm status notifies to phones, 0 means disable repeat notification.

❑ **Alarm ensuring timer**

It is a counter of alarm status ensure timer, designed to avoid shake mistakes. 0 means no counter.

❑ **“24 Hours” property**

If checked, the channel will execute alarm action (send alarm sms, interlock etc) when it is triggered, even CWT5016 is in disarm status.

❑ **“Sound” property**

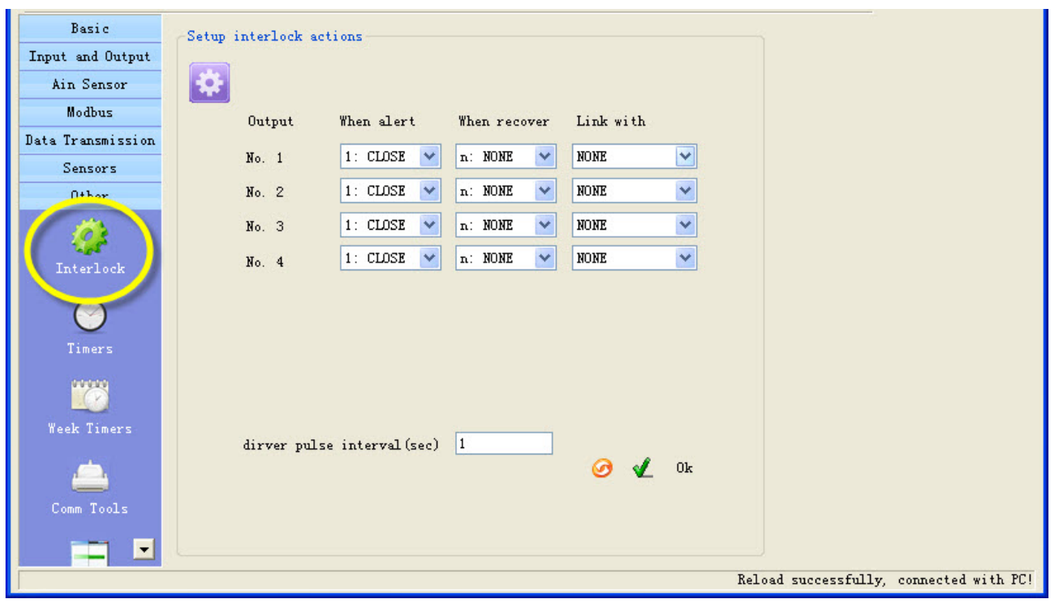
Means this line alarm event will cause internal buzzer and extend buzzer or siren action.

❑ **“Enable” property**

Enable or disable this channel’s alarm

4.6 Others setting

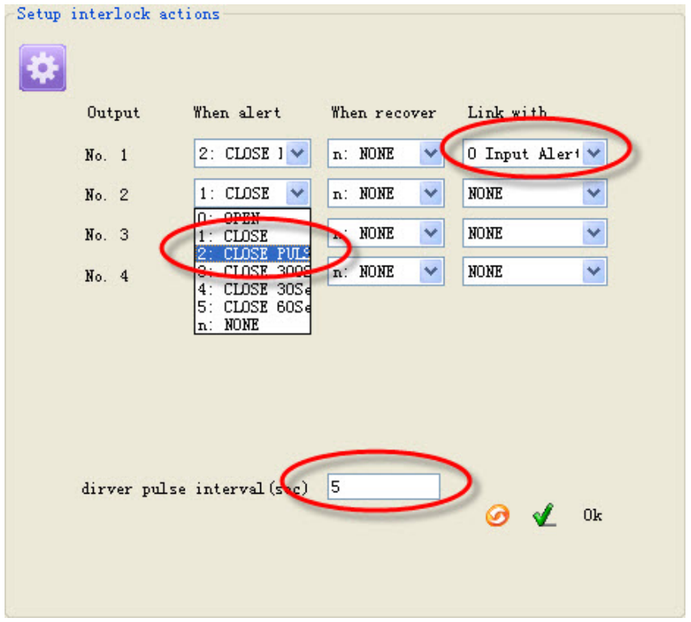
4.6.1 Realtime Interlock



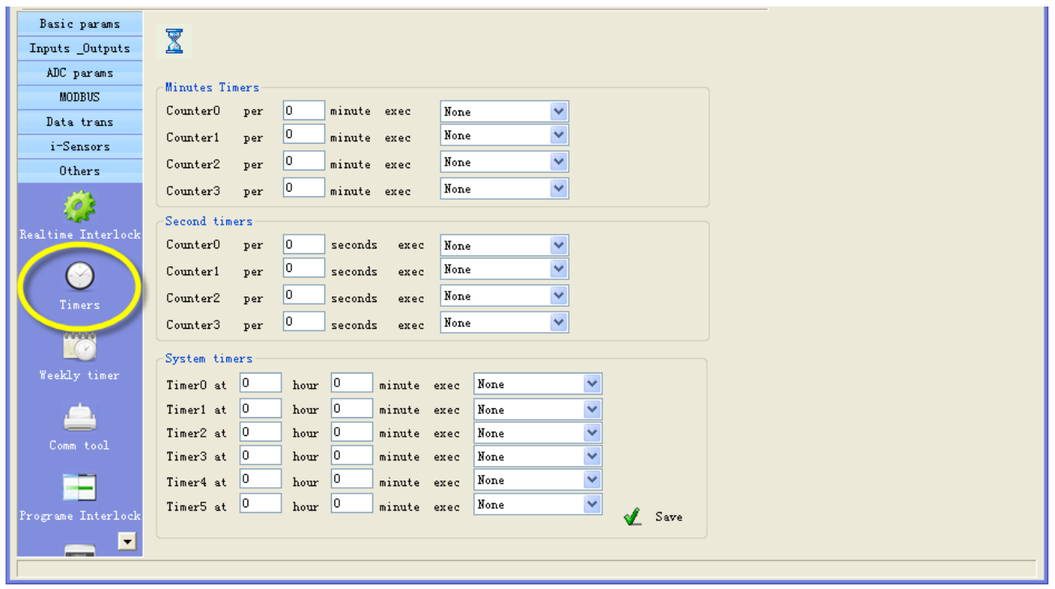
Realtime interlock is a local strategy, it is designed to outputs automatically execute action under some internal triggering conditions.

For example

If digital input 0 alert, output 0 close pulse 5 seconds.



4.6.2 Timers

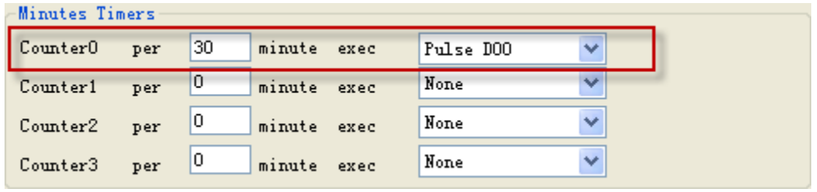

Basic params
Inputs _Outputs
ADC params
MODBUS
Data trans
i-Sensors
Others
Realtime Interlock
Timers
Weekly timer
Comm tool
Programe Interlock
Minutes Timers
Counter0 per 0 minute exec None
Counter1 per 0 minute exec None
Counter2 per 0 minute exec None
Counter3 per 0 minute exec None
Second timers
Counter0 per 0 seconds exec None
Counter1 per 0 seconds exec None
Counter2 per 0 seconds exec None
Counter3 per 0 seconds exec None
System timers
Timer0 at 0 hour 0 minute exec None
Timer1 at 0 hour 0 minute exec None
Timer2 at 0 hour 0 minute exec None
Timer3 at 0 hour 0 minute exec None
Timer4 at 0 hour 0 minute exec None
Timer5 at 0 hour 0 minute exec None
Save

Timers is designed to time execute task, task include arm, disarm, open/close output etc.

❑ **Minutes timers**

4 minute counters can be set, RTU execute a task every the minute interval.

For example, RTU execute output 0 pulse every 30 minutes


Minutes Timers
Counter0 per 30 minute exec Pulse DO0
Counter1 per 0 minute exec None
Counter2 per 0 minute exec None
Counter3 per 0 minute exec None

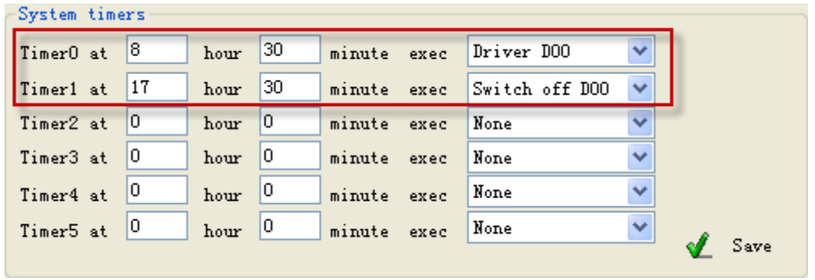
❑ **Second timers**

4 second counters can be set, RTU execute a task every the second interval.

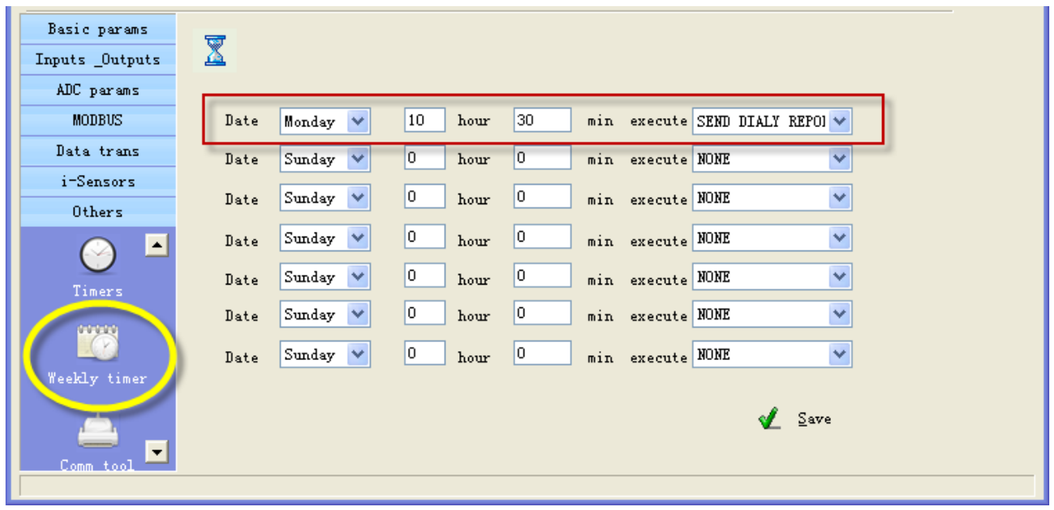
❑ **System timers**

6 times can be set in a day, RTU execute a task in each time.

For example, at 8:30 execute output 0 on, at 17:00 execute output 0 off.


System timers
Timer0 at 8 hour 30 minute exec Driver DO0
Timer1 at 17 hour 30 minute exec Switch off DO0
Timer2 at 0 hour 0 minute exec None
Timer3 at 0 hour 0 minute exec None
Timer4 at 0 hour 0 minute exec None
Timer5 at 0 hour 0 minute exec None
Save

4.6.3 Weekly timers


Basic params
Inputs _Outputs
ADC params
MODBUS
Data trans
i-Sensors
Others
Timers
Weekly timer
Comm tool
Date Monday 10 hour 30 min execute SEND DIALY REPOI
Date Sunday 0 hour 0 min execute NONE
Date Sunday 0 hour 0 min execute NONE
Date Sunday 0 hour 0 min execute NONE
Date Sunday 0 hour 0 min execute NONE
Date Sunday 0 hour 0 min execute NONE
Date Sunday 0 hour 0 min execute NONE
Save

7 times can be set in a week, RTU execute a task in each time.
For example, execute send daily report at Monday 10:30 RTU

4.6.4 Define users commands

Users can define 6 commands instead of system commands.
For example, user set “close” instead of system command “IOOH”, so user can send “close” to close output